

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

PROJECT TITLE: PLUTONIUM FINISHING PLANT W-460 PLUTONIUM STABILIZATION
AND HANDLING

Date Approved: 08-Oct-01
Emission Unit Name: 296-Z-5

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	2 parallel 2-stage HEPA filters of 4 banks each. Abatement credit taken for one HEPA filter.
	Fan	2	2 parallel flow paths with 2 fans in parallel

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	4 week sample/ year
Sampling Requirements: Record Sample			

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 10/08/01 DOE/RL-2000-42, Rev 2A, NOC Application/Permit Revision submitted and approved at the October 2, 2001 RTAM. Revised the process description to include thermogravimetric analysis (TGA). New Conditions/Limitations approved via AIR 01-1004 on October 08, 2001.
- 05/09/01 DOE/RL-2000-42, Rev 2, received on May 09, 2001 was approved via AIR 01-806 on August 21, 2001.
- 10/03/00 DOE/RL-2000-42, Rev 1, was received on October 03, 2000. Additional details regarding applicability of technology standards were requested. NOC was resubmitted on May 09, 2001.
- 06/06/00 NOC, DOE/RL-2000-42, Rev 0, received on June 06, 2000 was approved via AIR 00-709 on July 20, 2000.
- 03/06/00 NOC, DOE/RL-2000-23, Rev 0, was received March 06, 2000. USDOE provided a withdrawal to this NOC on May 11, 2000.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to $4.52\text{E-}04$ mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to $1.67\text{E+}03$ mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
stabilizing and/or repackaging plutonium, uranium, oxide, and metal for long term storage in the method described below. Within the 2736Z Building, existing vault storage cubicles may be modified to accommodate larger, long term storage canisters as described below.

Activities associated with the 296-Z-7 Emission Unit.

Americium, plutonium, and uranium oxides will be stabilized by heating the material in an oven to a temperature of greater than 950°C for a minimum of two hours.

In-line monitoring equipment will be provided for determining the moisture/volatile content of the material processed. An alternative method will exist to use thermogravimetric mass spectrometer analysis. The material will be considered thermally stabilized when there is less than 0.5 percent loss on ignition (LOI). Representative samples of 100 percent of the packages will be subjected to LOI testing (glovebox GB-642D). The LOI process will verify dryness and suitability for packaging. The LOI process will heat a sample taken from each material batch. The sample will be weighed and placed into a muffle furnace where the sample will undergo a heating cycle similar to the stabilization process. After the heating cycle is completed, the sample will be weighed again and the beginning and ending weights compared. If the beginning and ending weights differ by less than 0.5 percent, the material will go to final packaging in the BTS Module. If the difference in weights is greater than 0.5 percent, the material will be sent back through the stabilization process until the LOI result is less than 0.5 percent. The furnaces will be heated electrically. The purge gas in the LOI furnace will be nominally 1 scfm of air. The operating temperature of the offgas will be approximately $1,150^{\circ}\text{C}$ to $1,200^{\circ}\text{C}$. The offgas will be discharged directly to the glovebox where the offgas will mix with approximately 13°C nitrogen atmosphere in the LOI glovebox.

Thermogravimetric analysis (TGA) is an analytical tool that is similar to LOI, and may be used as an alternative method to determine moisture content of samples (gram quantities) of stabilized plutonium-bearing materials. Existing gloveboxes in the 2736-ZB Building may be configured to accommodate TGA instrumentation supporting moisture determinations related to the aforementioned 3013 Standard requirements (current version in effect at the time of testing). Minor modification activities include removal of unnecessary equipment and purge gas hookup (air, nitrogen, argon). Gaseous effluents from TGA operations will be routed to the existing ventilation system in 2736-BZ Building, which passes through two stages of HEPA filtration before discharge to the environment via the 297-Z-7 stack.

Another alternative method (to LOI) for determining the moisture content of the processed material is approved and may be implemented in the future. The method, supercritical fluid extraction (SFE), involves placing representative samples of stabilized material from a batch into porous sample cells in a glovebox. Supercritical carbon dioxide (CO_2 , approximately 100°C and 3,000 pounds per square inch) is passed through the sample, solubilizing water in the sample. The solubilized water is carried in the

fluid stream to a spectrometer for water detection and quantification. The measured fluid stream, composed of CO₂ and water, is released into the glovebox atmosphere. In normal operation, it is expected the SFE effluent would be only CO₂.

-Stabilization Module. The Stabilization Module consists of the material preparation area, furnace area, and the product fill area. In the material preparation area, canned items containing plutonium-bearing materials can be received, measured for accountability, and placed into a furnace tray (or boat) for insertion into a furnace in the furnace area. The module may also provide a waste pathway to dispose of the waste cans and plastic. In the furnaces, the material in the boats will be heated to greater than 950°C (Centigrade) for at least 2 hours, as specified in U.S. Department of Energy Standard 3013 (DOE-STD-3013, Criteria for Safe Storage of Plutonium Metals and Oxides). The material will be cooled, placed in a convenience can, sampled to verify dryness, and inserted into the Bagless Transfer System (BTS) Module.

-BTS Module. In the BTS Module, the filled convenience cans can be received from the Stabilization Module and placed into an inner can. The inner can head space can then be backfilled with helium. A plug will be welded to the inner wall of the container, and the middle of the weld would be cut (maintaining glovebox confinement at all times).

-Inner Can Leak Test Module. The Inner Can Leak Test Module will receive an inner welded container [bagless transfer container (BTC)]. Operations in this module will verify the BTC meets or exceeds the leak tightness requirements of DOE Standard 3013.

Activities associated with the 296-Z-5 Emission Unit.

Activities in 2736-ZB consist of continued operations historically associated with repackaging of special nuclear materials (SNM), shipping and receiving of SNM, non-destructive assay, and office space. The following are activities being conducted under this NOC.

-Outer Can Weld Module. The Outer Can Weld Module will receive a leak-checked BTC. The BTC will be placed in an outer container. The outer can head space will then be backfilled with helium, and an outer container lid will be welded onto the container in accordance with the requirements of DOE Standard 3013.

-Outer Can Leak Test Module. The Outer Can Leak Test Module will receive an outer welded container (3013 package) and operations in this module will verify that the package meets or exceeds the leak tightness requirements of 3013.

-NDA Laboratory Modification Module. The Nondestructive Analysis (NDA) Laboratory will receive the 3013 package and will analyze the 3013 package for isotopic distribution, heat load, and container baseline.

Activities associated with the 296-Z-6 Emission Unit.

-Vault Modification Module. The secure vault storage locations in the 2736Z Building will be modified to accommodate the 3013 packages. These packages will be sealed, offering no additional potential-to-emit (PTE). No modifications to the existing 2736-Z Building ventilation system, exhausting through minor stack 296-Z-6, will be made. A new chiller will be installed on the 2736Z Building roof to assist

in cooling the current supply air temperature. The cooling coil will be placed in the current (exterior) air supply ductwork with no change in the supply air flow rate or route, or in the 296-Z-6 radioactive airborne emissions. Additionally, a vault heating, ventilation, and air conditioning (HVAC) supply isolation damper will be installed on the supply air to minimize unfiltered release of effluent from the building via backflow out the HVAC supply system.

Activities associated with the 296-Z-5 and Z-7 Emission Units.

-Infrastructure Modification Module. Project W-460 will modify existing infrastructure support systems. Capacities of ventilation systems will be verified and enhanced if necessary. Configuration of the systems will be modified, if necessary, to provide appropriate separation of PFP and process enclosure ventilation. New systems will be installed if no system currently exists, but only if such systems do not effect potential to emit or current control capabilities of the effluent control system. Addition is planned of a new major exhaust stack 296-Z-7 and associated compliant monitoring equipment. Equipment pads for a nitrogen system and a gas bottle storage area will be installed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am	241	3.50E+04
Pu	239	1.00E+05
U-	233	1.10E+04

5) **This condition was obsoleted on 06/13/2001.** The annual possession quantities for all construction activities associated with the 296-Z-5 stack are limited to 1.2 E-5 curies for all radionuclides combined. The 296-Z-5 stack must remain operational during all construction activities.

Condition added by AIR 01-806.

6) The 2736-ZB building will exhaust out of the existing 296-Z-5 stack through two stages of individually testable HEPA filters. They will have a minimum efficiency of 99.95% for particulate with a median diameter of 0.3 microns.

Condition added by AIR 01-806.

7) Functional test differential pressure magnehelic gauges associated with 296-Z-5 HEPA filters annually.

Condition added by AIR 01-806.

8) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040-(5) and 246-247-060-(5)).

Condition added by AIR 01-806.

9) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

Condition added by AIR 01-806.

10) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

Condition added by AIR 01-806.

11) The facility shall notify the department seven days in advance of any planned pre-operational testing of

the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

Condition added by AIR 01-806.

- 12) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

Condition added by AIR 01-806.

- 13) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).

Condition added by AIR 01-806.

- 14) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).

Condition added by AIR 01-806.

- 15) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).

Condition added by AIR 01-806.

- 16) The Department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).

Condition added by AIR 01-806.

- 17) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

Condition added by AIR 01-806.

- 18) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. (WAC 246-247-080(2)).

Condition added by AIR 01-806.

- 19) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).

Condition added by AIR 01-806.

- 20) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060-(2)(d)).

Condition added by AIR 01-806.

- 21) **This condition was obsoleted on 10/03/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).

Condition added by AIR 01-806.

Replaced by condition issued in AIR 01-1004, October 08, 2001

- 22) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).

Condition added by AIR 01-806.

- 23) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event

the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

Condition added by AIR 01-806.

- 24) The unabated TEDE to the hypothetical MEI is $2.9E-2$ millirem/year from the 296-Z-5 emission unit. The abated TEDE to the hypothetical MEI is $1.5E-5$ millirem/year from the 296-Z-5 emission unit (giving abatement credit for one HEPA filter).

Condition added by AIR 01-806.

- 25) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

Condition added by AIR 01-1004.

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

PROJECT TITLE: PLUTONIUM FINISHING PLANT W-460 PLUTONIUM STABILIZATION
AND HANDLING

Date Approved: 08-Oct-01
Emission Unit Name: 296-Z-6

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: ALARACT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	two banks of 2-stage filters. Abatement credit given for one HEPA.
	Fan	1	

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	4 week sample/ year
Sampling Requirements: Record Sample			

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 10/??/01 DOE/RL-2000-42, Rev 2A, NOC Application/Permit Revision submitted and approved at the October 2, 2001 RTAM. Revised the process description to include thermogravimetric analysis (TGA). New Conditions/Limitations approved via AIR 01-1004 on October 08, 2001.
- 05/09/01 DOE/RL-2000-42, Rev 2, received on May 09, 2001 was approved via AIR 01-806 on August 21, 2001.
- 10/03/00 DOE/RL-2000-42, Rev 1, was received on October 03, 2000. Additional details regarding applicability of technology standards were requested. NOC was resubmitted on May 09, 2001.
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- 03/06/00 NOC, DOE/RL-2000-23, Rev 0, was received March 06, 2000. USDOE provided a withdrawal to this NOC on May 11, 2000.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 4.52E-04 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 1.67E+03 mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
stabilizing and/or repackaging plutonium, uranium, oxide, and metal for long term storage in the method described below. Within the 2736Z Building, existing vault storage cubicles may be modified to accommodate larger, long term storage canisters as described below.

Activities associated with the 296-Z-7 Emission Unit.

Americium, plutonium, and uranium oxides will be stabilized by heating the material in an oven to a temperature of greater than 950°C for a minimum of two hours.

In-line monitoring equipment will be provided for determining the moisture/volatile content of the material processed. An alternative method will exist to use thermogravimetric mass spectrometer analysis. The material will be considered thermally stabilized when there is less than 0.5 percent loss on ignition (LOI). Representative samples of 100 percent of the packages will be subjected to LOI testing (glovebox GB-642D). The LOI process will verify dryness and suitability for packaging. The LOI process will heat a sample taken from each material batch. The sample will be weighed and placed into a muffle furnace where the sample will undergo a heating cycle similar to the stabilization process. After the heating cycle is completed, the sample will be weighed again and the beginning and ending weights compared. If the beginning and ending weights differ by less than 0.5 percent, the material will go to final packaging in the BTS Module. If the difference in weights is greater than 0.5 percent, the material will be sent back through the stabilization process until the LOI result is less than 0.5 percent. The furnaces will be heated electrically. The purge gas in the LOI furnace will be nominally 1 scfm of air. The operating temperature of the offgas will be approximately 1,150°C to 1,200°C. The offgas will be discharged directly to the glovebox where the offgas will mix with approximately 13°C nitrogen atmosphere in the LOI glovebox.

Thermogravimetric analysis (TGA) is an analytical tool that is similar to LOI, and may be used as an alternative method to determine moisture content of samples (gram quantities) of stabilized plutonium-bearing materials. Existing gloveboxes in the 2736-ZB Building may be configured to accommodate TGA instrumentation supporting moisture determinations related to the aforementioned 3013 Standard requirements (current version in effect at the time of testing). Minor modification activities include removal of unnecessary equipment and purge gas hookup (air, nitrogen, argon). Gaseous effluents from TGA operations will be routed to the existing ventilation system in 2736-BZ Building, which passes through two stages of HEPA filtration before discharge to the environment via the 297-Z-7 stack.

Another alternative method (to LOI) for determining the moisture content of the processed material is approved and may be implemented in the future. The method, supercritical fluid extraction (SFE), involves placing representative samples of stabilized material from a batch into porous sample cells in a glovebox. Supercritical carbon dioxide (CO₂, approximately 100°C and 3,000 pounds per square inch) is passed through the sample, solubilizing water in the sample. The solubilized water is carried in the

fluid stream to a spectrometer for water detection and quantification. The measured fluid stream, composed of CO₂ and water, is released into the glovebox atmosphere. In normal operation, it is expected the SFE effluent would be only CO₂.

-Stabilization Module. The Stabilization Module consists of the material preparation area, furnace area, and the product fill area. In the material preparation area, canned items containing plutonium-bearing materials can be received, measured for accountability, and placed into a furnace tray (or boat) for insertion into a furnace in the furnace area. The module may also provide a waste pathway to dispose of the waste cans and plastic. In the furnaces, the material in the boats will be heated to greater than 950°C (Centigrade) for at least 2 hours, as specified in U.S. Department of Energy Standard 3013 (DOE-STD-3013, Criteria for Safe Storage of Plutonium Metals and Oxides). The material will be cooled, placed in a convenience can, sampled to verify dryness, and inserted into the Bagless Transfer System (BTS) Module.

-BTS Module. In the BTS Module, the filled convenience cans can be received from the Stabilization Module and placed into an inner can. The inner can head space can then be backfilled with helium. A plug will be welded to the inner wall of the container, and the middle of the weld would be cut (maintaining glovebox confinement at all times).

-Inner Can Leak Test Module. The Inner Can Leak Test Module will receive an inner welded container [bagless transfer container (BTC)]. Operations in this module will verify the BTC meets or exceeds the leak tightness requirements of DOE Standard 3013.

Activities associated with the 296-Z-5 Emission Unit.

Activities in 2736-ZB consist of continued operations historically associated with repackaging of special nuclear materials (SNM), shipping and receiving of SNM, non-destructive assay, and office space. The following are activities being conducted under this NOC.

-Outer Can Weld Module. The Outer Can Weld Module will receive a leak-checked BTC. The BTC will be placed in an outer container. The outer can head space will then be backfilled with helium, and an outer container lid will be welded onto the container in accordance with the requirements of DOE Standard 3013.

-Outer Can Leak Test Module. The Outer Can Leak Test Module will receive an outer welded container (3013 package) and operations in this module will verify that the package meets or exceeds the leak tightness requirements of 3013.

-NDA Laboratory Modification Module. The Nondestructive Analysis (NDA) Laboratory will receive the 3013 package and will analyze the 3013 package for isotopic distribution, heat load, and container baseline.

Activities associated with the 296-Z-6 Emission Unit.

-Vault Modification Module. The secure vault storage locations in the 2736Z Building will be modified to accommodate the 3013 packages. These packages will be sealed, offering no additional potential-to-emit (PTE). No modifications to the existing 2736-Z Building ventilation system, exhausting through minor stack 296-Z-6, will be made. A new chiller will be installed on the 2736Z Building roof to assist

in cooling the current supply air temperature. The cooling coil will be placed in the current (exterior) air supply ductwork with no change in the supply air flow rate or route, or in the 296-Z-6 radioactive airborne emissions. Additionally, a vault heating, ventilation, and air conditioning (HVAC) supply isolation damper will be installed on the supply air to minimize unfiltered release of effluent from the building via backflow out the HVAC supply system.

Activities associated with the 296-Z-5 and Z-7 Emission Units.

-Infrastructure Modification Module. Project W-460 will modify existing infrastructure support systems. Capacities of ventilation systems will be verified and enhanced if necessary. Configuration of the systems will be modified, if necessary, to provide appropriate separation of PFP and process enclosure ventilation. New systems will be installed if no system currently exists, but only if such systems do not effect potential to emit or current control capabilities of the effluent control system. Addition is planned of a new major exhaust stack 296-Z-7 and associated compliant monitoring equipment. Equipment pads for a nitrogen system and a gas bottle storage area will be installed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am	241	8.05E+04
Pu	239	2.30E+05
U-	233	2.53E+04

- 5) An approved modification for the 2736-Z Building is the replacement of the current shelving for new larger units to store the new 3013 compliant cans. The new 3013 cans (considered sealed sources) are approved for long-term storage in the 2736-Z Building. A new chiller will be installed on the 2736-Z Building roof to assist in cooling the current supply air temperature. The cooling coil will be placed in the current (exterior) air supply ductwork with no change in the supply air flow rate or route, or in the 296-Z-6 radioactive airborne emissions. Additionally, a vault HVAC supply isolation damper will be installed on the supply air to prevent unfiltered release of plutonium from the building via backflow out the HVAC supply system.

Condition added by AIR 01-806.

- 6) All differential pressure magnehelic gauges associated with 296-Z-6 HEPA filters must be functionally tested annually.

Condition added by AIR 01-806.

- 7) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040-(5)) and 246-247-060-(5)).

Condition added by AIR 01-806.

- 8) If this emission unit is not in compliance with the standards in WAC 246-247-040 during construction or operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).

Condition added by AIR 01-806.

- 9) The facility shall notify the department seven days in advance of any planned pre-operational testing of the emission unit's control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

Condition added by AIR 01-806.

- 10) The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards (WAC 246-247-075(6)).

Condition added by AIR 01-806.

- 11) The department retains the right to conduct stack sampling, environmental monitoring or other testing around this unit to assure compliance. If directed by the department, the facility must make provision for such testing (WAC 246-247-075(9) and (10)).
Condition added by AIR 01-806.
- 12) The facility must be able to demonstrate workers associated with this emission unit are trained in the use and maintenance of control and monitoring systems, and in the performance of associated tests and emergency procedures (WAC 246-247-075(12)).
Condition added by AIR 01-806.
- 13) The facility must be able to demonstrate the reliability and accuracy of emissions data and other test results from this emission unit (WAC 246-247-075(13)).
Condition added by AIR 01-806.
- 14) The department reserves the right to inspect and audit all construction activities, equipment, operations, documents, data and other records related to compliance with the requirements of this chapter (WAC 246-247-080(1)).
Condition added by AIR 01-806.
- 15) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
Condition added by AIR 01-806.
- 16) The facility must meet all reporting and record keeping requirements of 40 CFR 61, Subpart H. (WAC 246-247-080(2)).
Condition added by AIR 01-806.
- 17) The facility shall report all measured or calculated emissions annually (WAC 246-247-080(3)).
Condition added by AIR 01-806.
- 18) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).
Condition added by AIR 01-806.
- 19) **This condition was obsoleted on 10/03/2001.** When this project is complete, or operations cease, the facility must notify the department via a report of closure, including whether or not any potential for airborne releases occurred (WAC 246-247-080(6)).
Condition added by AIR 01-806.

Replaced by condition issued in AIR 01-1004 October 08, 2001
- 20) The facility shall maintain readily (promptly) retrievable storage areas (on site) for all records and documents related to, and which may help establish compliance with, the requirements of this chapter. The facility shall keep these records available for department inspection for at least five years (WAC 246-247-080(8)).
Condition added by AIR 01-806.
- 21) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced

inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

Condition added by AIR 01-806.

- 22) The facility shall make available, in timely manner, all documents requested by the department for review. The facility shall allow the department to review documents in advance of an inspection. The facility shall allow access to classified documents by representatives of the department with the appropriate security clearance and a demonstrable need-to-know (WAC 246-247-080(10)).

Condition added by AIR 01-806.

- 23) The unabated TEDE to the hypothetical MEI is $5.43\text{E-}2$ millirem/year from the 296-Z-6 emission unit. The abated TEDE to the hypothetical MEI is $2.72\text{E-}05$ millirem/year from the 296-Z-6 emission unit (giving abatement credit for one HEPA filter).

Condition added by AIR 01-806.

- 24) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6))

Condition added by AIR 01-1004.

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

PROJECT TITLE: PLUTONIUM FINISHING PLANT W-460 PLUTONIUM STABILIZATION
AND HANDLING

Date Approved: 08-Oct-01
Emission Unit Name: 296-Z-7

This is a MAJOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: None

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	2	2 dual stage units in parallel. Abatement credit given for 2 HEPAs.
	Fan	2	2 stage units in parallel.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	Continuous, collect samples biweekly at a minimum

Sampling Requirements: Continuous

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 10/??/01 DOE/RL-2000-42, Rev 2A, NOC Application/Permit Revision submitted and approved at the October 2, 2001 RTAM. Revised the process description to include thermogravimetric analysis (TGA). New Conditions/Limitations approved via AIR 01-1004 on October 08, 2001.
- 05/09/01 DOE/RL-2000-42, Rev 2, received on May 09, 2001 was approved via AIR 01-806 on August 21, 2001.
- 10/03/00 DOE/RL-2000-42, Rev 1, was received on October 03, 2000. Additional details regarding applicability of technology standards were requested. NOC was resubmitted on May 09, 2001.
- 06/06/00 NOC, DOE/RL-2000-42, Rev 0, received on June 06, 2000 was approved via AIR 00-709 on July 20, 2000.
- 03/06/00 NOC, DOE/RL-2000-23, Rev 0, was received March 06, 2000. USDOE provided a withdrawal to this NOC on May 11, 2000.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 4.52E-04 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 1.67E+03 mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
stabilizing and/or repackaging plutonium, uranium, oxide, and metal for long term storage in the method described below. Within the 2736Z Building, existing vault storage cubicles may be modified to accommodate larger, long term storage canisters as described below.

Activities associated with the 296-Z-7 Emission Unit.

Americium, plutonium, and uranium oxides will be stabilized by heating the material in an oven to a temperature of greater than 950°C for a minimum of two hours.

In-line monitoring equipment will be provided for determining the moisture/volatile content of the material processed. An alternative method will exist to use thermogravimetric mass spectrometer analysis. The material will be considered thermally stabilized when there is less than 0.5 percent loss on ignition (LOI). Representative samples of 100 percent of the packages will be subjected to LOI testing (glovebox GB-642D). The LOI process will verify dryness and suitability for packaging. The LOI process will heat a sample taken from each material batch. The sample will be weighed and placed into a muffle furnace where the sample will undergo a heating cycle similar to the stabilization process. After the heating cycle is completed, the sample will be weighed again and the beginning and ending weights compared. If the beginning and ending weights differ by less than 0.5 percent, the material will go to final packaging in the BTS Module. If the difference in weights is greater than 0.5 percent, the material will be sent back through the stabilization process until the LOI result is less than 0.5 percent. The furnaces will be heated electrically. The purge gas in the LOI furnace will be nominally 1 scfm of air. The operating temperature of the offgas will be approximately 1,150°C to 1,200°C. The offgas will be discharged directly to the glovebox where the offgas will mix with approximately 13°C nitrogen atmosphere in the LOI glovebox.

Thermogravimetric analysis (TGA) is an analytical tool that is similar to LOI, and may be used as an alternative method to determine moisture content of samples (gram quantities) of stabilized plutonium-bearing materials. Existing gloveboxes in the 2736-ZB Building may be configured to accommodate TGA instrumentation supporting moisture determinations related to the aforementioned 3013 Standard requirements (current version in effect at the time of testing). Minor modification activities include removal of unnecessary equipment and purge gas hookup (air, nitrogen, argon). Gaseous effluents from TGA operations will be routed to the existing ventilation system in 2736-BZ Building, which passes through two stages of HEPA filtration before discharge to the environment via the 297-Z-7 stack.

Another alternative method (to LOI) for determining the moisture content of the processed material is approved and may be implemented in the future. The method, supercritical fluid extraction (SFE), involves placing representative samples of stabilized material from a batch into porous sample cells in a glovebox. Supercritical carbon dioxide (CO₂, approximately 100°C and 3,000 pounds per square inch) is passed through the sample, solubilizing water in the sample. The solubilized water is carried in the

fluid stream to a spectrometer for water detection and quantification. The measured fluid stream, composed of CO₂ and water, is released into the glovebox atmosphere. In normal operation, it is expected the SFE effluent would be only CO₂.

-Stabilization Module. The Stabilization Module consists of the material preparation area, furnace area, and the product fill area. In the material preparation area, canned items containing plutonium-bearing materials can be received, measured for accountability, and placed into a furnace tray (or boat) for insertion into a furnace in the furnace area. The module may also provide a waste pathway to dispose of the waste cans and plastic. In the furnaces, the material in the boats will be heated to greater than 950°C (Centigrade) for at least 2 hours, as specified in U.S. Department of Energy Standard 3013 (DOE-STD-3013, Criteria for Safe Storage of Plutonium Metals and Oxides). The material will be cooled, placed in a convenience can, sampled to verify dryness, and inserted into the Bagless Transfer System (BTS) Module.

-BTS Module. In the BTS Module, the filled convenience cans can be received from the Stabilization Module and placed into an inner can. The inner can head space can then be backfilled with helium. A plug will be welded to the inner wall of the container, and the middle of the weld would be cut (maintaining glovebox confinement at all times).

-Inner Can Leak Test Module. The Inner Can Leak Test Module will receive an inner welded container [bagless transfer container (BTC)]. Operations in this module will verify the BTC meets or exceeds the leak tightness requirements of DOE Standard 3013.

Activities associated with the 296-Z-5 Emission Unit.

Activities in 2736-ZB consist of continued operations historically associated with repackaging of special nuclear materials (SNM), shipping and receiving of SNM, non-destructive assay, and office space. The following are activities being conducted under this NOC.

-Outer Can Weld Module. The Outer Can Weld Module will receive a leak-checked BTC. The BTC will be placed in an outer container. The outer can head space will then be backfilled with helium, and an outer container lid will be welded onto the container in accordance with the requirements of DOE Standard 3013.

-Outer Can Leak Test Module. The Outer Can Leak Test Module will receive an outer welded container (3013 package) and operations in this module will verify that the package meets or exceeds the leak tightness requirements of 3013.

-NDA Laboratory Modification Module. The Nondestructive Analysis (NDA) Laboratory will receive the 3013 package and will analyze the 3013 package for isotopic distribution, heat load, and container baseline.

Activities associated with the 296-Z-6 Emission Unit.

-Vault Modification Module. The secure vault storage locations in the 2736Z Building will be modified to accommodate the 3013 packages. These packages will be sealed, offering no additional potential-to-emit (PTE). No modifications to the existing 2736-Z Building ventilation system, exhausting through minor stack 296-Z-6, will be made. A new chiller will be installed on the 2736Z Building roof to assist

in cooling the current supply air temperature. The cooling coil will be placed in the current (exterior) air supply ductwork with no change in the supply air flow rate or route, or in the 296-Z-6 radioactive airborne emissions. Additionally, a vault heating, ventilation, and air conditioning (HVAC) supply isolation damper will be installed on the supply air to minimize unfiltered release of effluent from the building via backflow out the HVAC supply system.

Activities associated with the 296-Z-5 and Z-7 Emission Units.

-Infrastructure Modification Module. Project W-460 will modify existing infrastructure support systems. Capacities of ventilation systems will be verified and enhanced if necessary. Configuration of the systems will be modified, if necessary, to provide appropriate separation of PFP and process enclosure ventilation. New systems will be installed if no system currently exists, but only if such systems do not effect potential to emit or current control capabilities of the effluent control system. Addition is planned of a new major exhaust stack 296-Z-7 and associated compliant monitoring equipment. Equipment pads for a nitrogen system and a gas bottle storage area will be installed.

4) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am	241	3.50E+04
Pu	239	1.00E+05
U-	233	1.10E+04

- 5) These Conditions and Limitations must be documented in an established procedure prior to starting activities granted by this approval (WAC 246-247-040(5)) and (WAC 246-247-060(5)).

Condition added by AIR 01-806.

- 6) **This condition was obsoleted on 06/13/2001.** This approval with its Conditions and Limitations must be included in the next revision of the Hanford Air Operating Permit (WAC 246-247-060(1)(e) and (2)(c)), and will at that time, constitute a revision of the Radioactive Air Emissions License.

Condition obsoleted by Air Operating Permit issuance.

- 7) If the department finds that the emission unit described in this NOC is not in compliance with the standards in WAC 246-247-040 during construction or during operation, the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).

Condition added by AIR 01-806.

- 8) The facility shall notify the department at least seven days prior to any planned preoperational testing of the emission unit's emissions control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).

Condition added by AIR 01-806.

- 9) The department reserves the right to conduct its own stack sampling, environmental monitoring or other testing, as required around this unit to assure compliance. The facility must make provisions for such testing during construction. The department intends to split occasional stack samples on 296-Z-7 (WAC 246-247-075(10)).

Condition added by AIR 01-806.

- 10) The facility must be able to demonstrate that the workers associated with this emission unit are adequately trained in the use and maintenance of emission control and monitoring systems, and in the performance of associated test and emergency response procedures (WAC 246-247-075(12)).

Condition added by AIR 01-806.

- 11) The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13)) and (WAC 246-247-075(6)). The facility must be able

to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above-cited regulation.

Condition added by AIR 01-806.

- 12) The department reserves the right to inspect and audit this unit during construction and operation, including all activities, equipment, operations, documents, data, and other records related to compliance with the regulations (WAC 246-247-080(1)). Periodic inspections will occur.

Condition added by AIR 01-806.

- 13) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).

Condition added by AIR 01-806.

- 14) All reports and records must be kept and reported according to 40 CFR 61, Subpart H (WAC 246-247-080(2)).

Condition added by AIR 01-806.

- 15) All measured or calculated emissions must be reported annually (WAC 246-247-080(3)).

Condition added by AIR 01-806.

- 16) The facility shall report to the department within 24 hours, any unexpected release of radioactivity, shutdown or other condition that, if allowed to persist, or lasts more than four hours, would result in the emission of radionuclides in excess of any standards or limitation in the license. Applicable standards (WAC 246-247-040) include unit specific emission limits (paragraph 5), the offsite dose standard (paragraph 1), BARCT (paragraph 3) or ALARACT (paragraph 4), whichever is applicable, or any limitation included in this approval (paragraph 5) (WAC 246-247-080(5)).

Condition added by AIR 01-806.

- 17) Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).

Condition added by AIR 01-806.

- 18) The facility shall ensure all emissions units are fully accessible to department inspectors. In the event the hazards associated with accessibility to a unit require training and/or restriction or requirements for entry, the facility owner or operator shall inform the department, prior to arrival, of those restrictions or requirements. The owner or operator shall be responsible for providing the necessary training, escorts, and support services to allow the department to inspect the facility. At a minimum for unannounced inspections, such requirements or restrictions must be told to inspectors to provide an opportunity for inspectors to meet those requirements prior to the inspection (WAC 246-247-080(9)).

Condition added by AIR 01-806.

- 19) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).

Condition added by AIR 01-806.

- 20) When this project is completed, or operations cease, the facility shall notify the department via a report of closure, and indicate whether or not any potential for airborne release occurred (WAC 246-247-080(6)).

Condition added by AIR 01-806.

- 21) The materials to be stabilized and or repackaged under Project W-460 are limited to the plutonium and uranium oxides and metals that are already stored in Plutonium Finishing Plant (PFP) complex.

Condition added by AIR 01-806.

- 22) **This condition was obsoleted on 06/13/2001.** Activities approved under this NOC are those associated with the construction and operation of activities involving the stabilization and repackaging

of plutonium in 2736-ZB Building and the construction of a new major exhaust stack to be built and operated in the 2736-ZB Building to handle the effluents associated with these processes.

Condition added by AIR 01-806.

- 23) If the design of the ventilation system differs from that submitted in this NOC or the activities described in this project change, the project must obtain additional approval from DOH prior to commencement of construction.

Condition added by AIR 01-806.

- 24) The new stack 296-Z-7 must be compliant to all the technology standards listed in (WAC 246-247-110(18)). This information must be made available to DOH upon request. Inspections will verify full compliance. If there are any deviations from these standards, prior approval must be obtained from the department.

Condition added by AIR 01-806.

- 25) The new stack 296-Z-7 must be compliant to all the requirements of ANSI N13.1 (1999). Prior to installation, the department must approve the specific design if it deviates from the design submitted in this NOC. All required technical specifications shall be documented as required in the ANSI N13.1 and submitted to DOH upon request.

Condition added by AIR 01-806.

- 26) The stack monitoring system shall consist of two shrouded probes located in the exhaust stream within the stack at an elevation of approximately 25 feet above grade. Each probe will have a sample line to deliver the sample stream to the stack monitoring equipment located at the base of the stack. One sample line will be connected to a continuous alpha monitor and the other line dedicated to the record air filter. The sample flow will be proportional to the stack flow. A stack mass flow sensor will be located near the shrouded probes. Inspection and test ports shall be provided. The design must include the ability for the department to split stack samples.

Condition added by AIR 01-806.

- 27) The alpha stack monitor shall have fail and high radiation alarms. These alarms are tied into an annunciator panel that will be used to notify operations of off normal conditions requiring immediate corrective actions. Sample pumps located downstream from the alpha monitor and the record sampler in the pump skid will draw representative samples from the stack stream. Exhausts from the pumps will return to the stack above the sample location.

Condition added by AIR 01-806.

- 28) Deposition losses in the sample lines must be evaluated. The results must be documented and issued in a report submitted to DOH after 12 months of operation.

Condition added by AIR 01-806.

- 29) Sampling for stack 296-Z-7 shall operate in a continuous mode.

Condition added by AIR 01-806.

- 30) Radioisotopes to be encountered during construction, stabilization and packaging activities include the following: uranium-235, uranium-238, plutonium-238, plutonium-239, plutonium-240, plutonium-241, plutonium-242, americium-241 and americium-243.

Condition added by AIR 01-806.

- 31) The unabated TEDE to the hypothetical MEI is 1,670 millirem/year from the 296-Z-7 emission unit. The abated TEDE to the hypothetical MEI is $4.1E-4$ millirem/year from the 296-Z-7 emission unit.

Condition added by AIR 01-806.

- 32) The total annual possession quantities are limited to the following: total plutonium isotopes - 1.6 metric tons/year, total uranium isotopes - 1.1 tons/year, and total americium isotopes - 0.01 metric tons/year.

Condition added by AIR 01-806.

- 33) Soil excavation to support Project W-460 activities requires that a survey of the soil be performed every linear and vertical foot before and during excavation. Contaminated soil that is used as backfill must result in activity less than 50 cpm (counts per minutes) alpha or 500,000 cpm beta/gamma. These surveys must be recorded. These records must be made available to DOH upon request.

Condition added by AIR 01-806.

- 34) During soil excavation, if the contamination levels exceed 140 dpm alpha or 50,000 dpm beta/gamma, work must stop and DOH must be notified within twenty-four hours. DOH may request that an estimation of the dose due the excavation activities be calculated.

Condition added by AIR 01-806.

- 35) Contaminated soils must be separated from the piles of clean soil during excavation. The movement of contaminated soil will be controlled using fixatives, water and covers.

Condition added by AIR 01-806.

- 36) If contamination is more extensive than the prescribed limits, the spread of contamination must be controlled during the backfilling of soil. Minimal water shall be applied using a hand sprayer to control dust.

Condition added by AIR 01-806.

- 37) If contamination is present on the soil surface, the soil will either be removed and containerized, or covered with clean fill soil. After backfilling of the excavation site, where radiological contaminated soil is used as backfill, the surface soil will be surveyed to verify no contamination is on the soil surface.

Condition added by AIR 01-806.

- 38) The area will be radiologically posted both during and after completion of the Project W-460, if appropriate.

Condition added by AIR 01-806.

- 39) The loss on ignition (LOI) purge gas flow rate will be 1 cfm of air or inert gas. The offgas temperature will range from 1,150 C to 1,200 C. The offgas is discharged directly into the glovebox. There it will mix with the approximately 13 C nitrogen atmosphere in the LOI glovebox.

Condition added by AIR 01-806.

- 40) Supercritical fluid extraction (SFE) is also approved for the testing of oxide purity. The measured fluid stream of CO₂ and water are exhausted into the glovebox atmosphere.

Condition added by AIR 01-806.

- 41) The temperature of the offgas must be below 80 C prior to passing through dual stage testable HEPA filters. After exiting the HEPA filters, the offgas exits through the new stack 296-Z-7. The temperatures of the offgas must be established during operation to insure they are not exceeded. The documentation of the temperature must be available to DOH upon request.

Condition added by AIR 01-806.

- 42) The dual stage of HEPA filters shall be able to be individually tested with minimum efficiency of 99.95%.

Condition added by AIR 01-806.

- 43) Procedures must be developed to leak test and to check for contamination on the outside of the welded containers prior to transporting them to various designated areas of the project. Appropriate staff must be trained on these procedures prior to the start of the project. These procedures will be available for DOH review upon request.

Condition added by AIR 01-806.

- 44) Operational activities in Room 642 are limited to equipment testing, routine maintenance, material bag-in and bag-out, sampling, heating of materials in the four muffle furnaces, packaging, inner can welding, leak testing, and decontamination. The containers may only be opened in that area and ventilated through the 296-Z-7 stack.
Condition added by AIR 01-806.
- 45) **This condition was obsoleted on 06/13/2001.** The exhaust from the material bagout and preparation areas must each pass through a HEPA filter upon exiting the glove box. Prior to joining the main line, the exhaust must pass through to a HEPA filter prior to connecting with the Room 642 exhaust filter and then to the dual stage HEPA filter and exiting through stack 296-Z-7. All HEPA filters must be tested.
- 46) The product fill glove box located in Room 642 must be exhausted through a HEPA type filter before connecting to the Room 642 exhaust HEPA filter.
Condition added by AIR 01-806.
- 47) The maximum design life of this project is not to exceed 20 years. All work must be completed by October 1, 2021.
Condition added by AIR 01-806.
- 48) **This condition was obsoleted on 06/13/2001.** Gloveboxes must have two exhaust systems, including a normal and an emergency system. Inside of each glove box, the normal exhaust system must have a roughing filter and fire screen. Outside of the glovebox, the normal exhaust system must be connected to a testable high efficiency particulate air (HEPA) filter.
- 49) The Department of Health requires that a particle size distribution study be conducted for 296-Z-7 emission unit after 12 months of full operation.
Condition added by AIR 01-806.
- 50) The emergency exhaust line does not have any fire screens or filters. The normal and emergency lines are combined and routed to the process exhaust HEPA filter system. Prior to passing through dual stage testable HEPA filters, the offgas temperature must be below 80 C.
Condition added by AIR 01-806.
- 51) All differential pressure magnehelic gauges associated with 296-Z-7 HEPA filters must be functionally tested annually.
Condition added by AIR 01-806.
- 52) In these Conditions and Limitations, all filters designated as HEPA filters must be testable to a minimum of 99.95% efficiency.
Condition added by AIR 01-806.
- 53) All HEPA filters must be tested annually for efficiency.
Condition added by AIR 01-806.
- 54) All filters (HEPA and HEPA-type) must have differential pressure gauges to demonstrate that they are operating as designed. Alternative methods to demonstrate efficiency must be approved by the department.
Condition added by AIR 01-806.
- 55) Unless otherwise indicated below, all sections of ANSI N509 are required for the controls associated with the new 296-Z-7 emission unit.

The following sections of N509 are considered to be not applicable to this emission unit because the systems covered are not included in the design or comply with the AG-1 standard rather than N509:

- Section 3 (habitability systems).
- Section 4.1c (iodine controls), d (demisters), e (heaters), and f (postfilters).
- Section 4.2 c (reactor requirement for pressure-time transients).
- Section 4.2 f (entrained liquid mass flow rate).
- Section 4.2 k (structural loadings).
- Section 4.2 q (adsorbers).
- Section 4.2 r (heaters).
- Section 4.3 (adsorber requirement).
- Section 4.6.5.2 (reactor containment structures).
- Section 4.6.5.4a (de-energizing power to fans, which there is no provision for).
- Section 4.6.5.4b (de-energizing power to fans, which there is no provision for).
- Section 4.7.1c (HEPA housings in contaminated areas).
- Section 4.7.2a and b (habitability).
- Section 4.9.2b and c (local alarms and local controls, which are not present in system).
- Section 4.10 (adsorbers).
- Section 4.11.2 (adsorbers).
- Section 4.11.6, 8, and 9 (fire suppression systems, which are not installed).
- Section 4.12 (treatment system insulation).
- Section 4.13b (adsorbers).
- Section 4.14.3 (test pressures that are not equal to operating static pressure- this system has equal pressures).
- Section 5.2.1, 5.2.2, 5.2.3.1, 5.2.3.2, 5.2.3.3, 5.2.4, 5.2.5.1, and 5.2.5.2 (adsorbers).
- Section 5.4, 5.4.1 and 5.4.2 (moisture separators, which are not present).
- Section 5.5, 5.5.1, 5.5.2, 5.5.3, and 5.5.4 (heaters).
- Section 5.6.2 b (lighting, which is not present).
- Section 5.6.2 e (flanged connections).
- Section 5.6.2 f (flexible connections between filter housings).
- Section 5.6.4.5 (engineered safety feature systems built of galvanized steel).
- Section 5.6.5.1 (non-permanent sampling manifolds).
- Section 5.6.5.1 (for air cleaning systems with no inlet or outlet ducts).
- Section 5.8.2 (for engineered safety feature fan systems).
- Section 5.8.3 (for installing motors onsite).
- Section 5.9.3.1, 5.9.3.2, 5.9.5, 5.9.6, 5.9.7.1, 5.9.7.2, 5.9.8, 5.9.9, 5.9.10, and 5.9.11 (air cleaning unit dampers- this system uses butterfly valves).
- Section 5.10.7 (coatings on ductwork).

Condition added by AIR 01-806.

56) The butterfly dampers that are not applicable to ANSI N509 must meet the AG-I Criteria:

- Section 5.9.5 .
- Section 5.9.6 .
- Section 5.9.7.1.
- Section 5.9.8.
- Section 5.9.9.
- Section 5.9.10.
- Section 5.9.11.

Condition added by AIR 01-806.

57) The following requirements, listed as "open" in the Notice of Construction, must be fully compliant before the 296-Z-7 system becomes operational and before any processing may begin. Documentation of compliance must be provided to WDOH prior to startup.

- Section 4.6.5.4a. Backdraft dampers must meet positive pressure requirements.
- Section 4.9.3a, b and c. Instrumentation and mountings must be qualified to this standard.
- Section 5.3.3. Report on pre and post filter dimensions, compliance with UL900 and ASHRAE 52, materials of construction etc. must be provided.
- Section 5.6.3. Drawings of clamping devices for HEPA filters must be submitted to DOE.
- Section 5.6.5.2. Documentation of visual inspections of HEPA filter housings must be provided.
- Section 5.6.5.3. HEPA filter housing welds must be shop tested with magnetic particles or liquid penetrates.
- Section 5.6.5.4. All filter housings must be shop tested before shipment to Hanford. Documentation must be provided.
- Section 5.6.5.5. Airflow distribution testing must be performed prior to shipment on filter housings HEP-14,-15,-16, and-17.
- Section 5.6.5.6. Air-aerosol mixing uniformity tests must be performed in the shop as required by N510 for HEP-14, 15,-16,-17.
- Section 5.7.5. Calculations and descriptions of fan qualification tests must be furnished.
- Section 5.10.8.1 and 5.10.8.2. All ductwork must be pressure tested.
- Section 7.3. All documentation of welds must be completed.
- Section 7.4 As-builts must confirm installation requirements are met and documentation provided.
- Section 8.1. ALL components must be demonstrated to have been procured through a NQA-1 program.
- Section 8.2. Vendor drawings and approval data must be provided.

Condition added by AIR 01-806.

- 58) The following requirements, listed as OPEN in the Notice of Construction, are test-dependent. That is, system testing requires drawing outside air into Room 642 (in the 2736-ZB Building) and through the 296-Z-7 exhaust train to complete the testing and close these items. A small potential for in-leakage from the remainder of the 2736-ZB into Room 642 exists.

Section 5.10.9. Balancing must be completed of the air treatment system.

Balancing the ventilation system requires simultaneous operation of all components upstream of the exhaust fans. The components include the nitrogen generator, the supply fan system, and the exhaust system to establish the correct differential pressures for the airlock, the 642 Room, and each of the gloveboxes.

Section 7.2. Installation must be performed in strict adherence to the layout drawings.

Installation of equipment has been performed in strict adherence to the layout drawings, and any deviations have been approved by the responsible engineer. As Section 7.2 requires, the "As-Built" drawings will reflect those design changes. The "As-Built" drawings will be documented upon completion of testing.

Section 9. Documentation of acceptance tests must be provided.

Acceptance testing includes HEPA filter efficiency testing, glovebox balancing, and room/building ventilation balancing. Upon completion of these tests, the documentation shall be made available to the department.

The following limitations must be implemented during testing activities conducted to close the items listed above and will not result in an increased potential-to-emit or airborne releases from the 296-Z-5

system to the environment. These shall be documented and be made available for department review.

1. The 296-Z-5 stack must be operational during all 296-Z-7 system testing. All 296-Z-7 system testing will cease immediately upon loss of 296-Z-5 operation and the department notified within 24 hours.

2. 2736-ZB Building constant air monitors will operate per approved procedures during 296-Z-7 system testing.

3. The new 296-Z-7 HEPA filters will be in place and efficiency-tested as part of acceptance testing.

Condition added by AIR 01-806.

- 59) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with (WAC 246-247-080(8)). (WAC 246-247-080(6)).

Condition added by AIR 01-1004.